REMARKS

Reconsideration and allowance of the subject application are respectfully requested.

Applicants note with appreciation the Examiner's acknowledgement of the foreign priority claim and receipt of the certified copy of the priority document. Applicants respectfully request that the Examiner acknowledge the claim for domestic priority under 35 U.S.C. §120, since a specific reference was included in the first sentence of the specification that this application is a continuation of PCT/SE00/01679 filed on September 1, 2000, as indicated by amendment included in the application data sheet filed on March 1, 2002.

The Examiner objects to the title as not descriptive. A new title "Stacked Patch Antenna" has been supplied by this amendment. Withdrawal of the objection to the title is respectfully requested.

Claims 31-35, 37-38, 40, 42, 44, 46, 48-58 stand rejected under 35 U.S.C. §102(b) as being anticipate by U.S. Patent 5,703,601 to Nalbandian et al. This rejection is respectfully traversed.

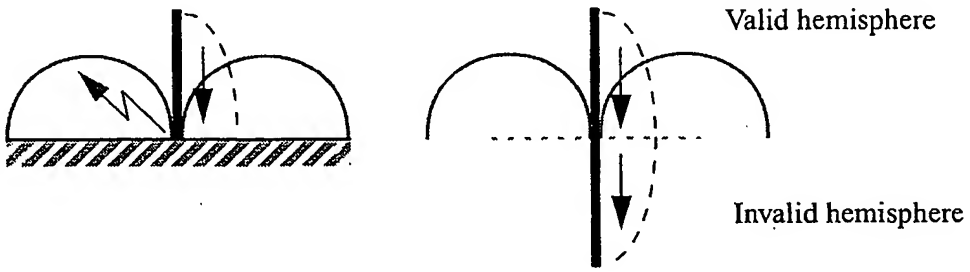
To establish that a claim is anticipated, the Examiner must point out where each and every limitation in the claim is found in a single prior art reference. *Scripps Clinic & Research Found. v. Genentec, Inc.*, 927 F.2d 1565 (Fed. Cir. 1991). Every limitation contained in the claims must be present in the reference, and if even one limitation is missing from the reference, then it does not anticipate the claim. *Kloster Speedsteel AB*

v. Crucible, Inc., 793 F.2d 1565 (Fed. Cir. 1986). Nalbandian fails to satisfy this rigorous standard.

Nalbandian discloses a double-layer, *circularly-polarized* antenna with a single feed. Nalbandian's circularly-polarized antenna is made from microstrip constructed with a ground plane and two spaced conductive patches that form upper and lower cavities. The antenna is excited by way of a coaxial cable having its sheath connected to the ground plane, and its central conductor connected to both patches. Being a circularly-polarized microstrip antenna, Nalbandian's antenna is—by definition—a *dipole* type antenna.

In contrast, claims 31 and 32 recite monopole antennas that are linearly-polarized. From an electromagnetics point of view, a dipole type antenna is fundamentally different from a monopole type antenna. Although superficially they may have a similar geometry, they operate (radiate) in very different ways.

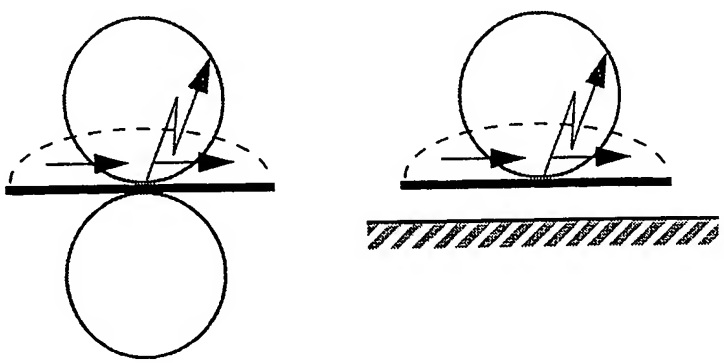
In a monopole antenna, current flows on a conductor toward an open end of the conductor which corresponds to the "monopole." The following figure illustrates the operation of a monopole antenna.



The black arrows show current flow, the dashed lines indicate relative current strength, and the solid lines indicate radiation pattern behavior. The principle direction of radiation is along the ground plane, and there is no radiation in the upward direction. Monopoles are inherently unbalanced because electrons on the conductor are not "associated" with holes on the corresponding mirror conductor. If a monopole antenna is mounted on a ground plane, either finite or infinite, the ground plane acts as a counterpoise for the antenna current. The effect of an infinite ground plane can be modeled using imaging of the currents on the actual monopole antenna with the ground plane removed. The result of this model is only valid in the upper hemisphere as shown in the figure above.

On the other hand, a dipole antenna is a balanced structure with respect to the antenna portion (although not necessary with respect to the feed point). Current flows from one end of the antenna towards the other without a counterpoise because the amount of current on the antenna flowing towards the antenna feed point (or terminals) is equal to the amount of current on the antenna flowing away from the feed point.

The following figure illustrates the operation of a dipole antenna:



The first drawing on the left shows the dipole's principle of operation in free space, and the second drawing to the right is over a ground plane corresponding to a patch antenna. Black error showing current flow, dashed lines indicate relative current strength, and solid lines pointing upward indicate radiation direction. Most of the radiation is along the normal to the ground plane with little or no radiation along the ground plane.

Copies of the following background references [1]-[6] relating to monopole and dipole antennas will follow shortly in an Information Disclosure Statement for the Examiner's information:

[1] C. Delavaud et al., "Small-sized low-profile antenna to replace monopole antennas", Electron Lett., Vol. 34, No. 8, pages 716-717, April 1998.

[2] H.D. Foltz et al., "Disk-loaded monopoles with parallel strip elements," IEEE Trans. Antennas Propagat., Vol. 46, No. 12, pages 1894-1896.

[3] G. Kossiavas et al., "The C-patch: a small microstrip element", Electron Lett., Vol. 25, No. 4, pages 253-254, February 1989.

[4] K.L. Virga et al., "Low-profile enhanced-bandwidth PIFA antennas for wireless communications packaging", IEEE Trans. Antennas Propagat. Vol. 45, No. 10, pages 1879-1888, October 1997.

[5] Balanis, Antenna theory: analysis and design, John Wiley & Sons, Inc., New York, pages 133-202, 1997.

[6] A. Derneryd, "Linearly polarized microstrip antennas", IEEE Trans. Antennas propagat., Vol. AP-24, No. 6, pages 846-851, November 1976.

Examples of monopole antennas include disk-loaded monopoles shown in references [1] and [2], C-patches described in reference [3], and PIFAs (planar inverted F-antenna) described in reference [4]. Examples of a dipole antenna include conventional dipoles, described in reference [5], conical dipoles, and slot antennas. A very common antenna type is the rectangular microstrip patch antenna [6] background which is a dipole type antenna located over a ground plane.

Nalbandian's *circularly-polarized dipole* antenna fails to disclose the *linearly-polarized monopole* antenna recited in claims 31 and 32. Accordingly, the anticipation rejection of these claims should be drawn.

Claims 36, 39, 41, 43, 45,47 and 59-60 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Nalbandian in view of EP publication 0 795 926. This rejection is respectfully traversed.

Since the Examiner did not apply the EP publication to overcome the noted deficiencies of Nalbandian, it is respectfully submitted that this rejection is moot.

For the reasons set forth above, Applicants respectfully submit that the present application is now in condition for allowance. An early notice to that effect is earnestly solicited.

Respectfully submitted,

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